

# Penn Cambria Curriculum

<b>Course Name</b>	<b>Financial Math</b>
<b>Length of Course</b>	1 credit = 1 semester in block schedule
<b>Grade Level</b>	12 <sup>th</sup> grade
<b>Prerequisites</b>	** Open to grade 12 students only
<b>Course Description</b>	Financial Math is a course designed to allow students the opportunity to advance math skills through the authentic application of math in solving real-world problems. Mathematical reasoning and problem solving will be emphasized as students learn how math concepts apply to earnings, investments, interest and budgeting.
<b>Units of Study</b>	Managing Your Money Managing Expenses Vehicles Housing and Insurance Investments
<b>Materials</b>	Text: <u>Mathematics for Business and Personal Finance</u> , Glencoe, c2010. Supplemental Materials: Spreadsheet program- online tools and calculators, PLATO and BlendedSchools.net resources

## Unit 1: Managing Your Money

**Estimated Time: 2-3 weeks**

### Standard Alignment:

- 2.1.11A – Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).  
 2.2.11A – Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.  
 2.2.11F – Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.  
 2.4.11E – Demonstrate mathematical solutions to problems (e.g., in the physical sciences).

### Curricular Objectives:

Students will be able to:

- Calculate salary and/or earnings based on multiple factors including overtime, piecework pay, pay periods and commission.
- Calculate amounts withheld from paychecks for various federal and state taxes.
- Compute deductions or amounts withheld from paychecks for insurance, Social Security, Medicare, retirement and various other withholdings, making adjustments for dependents and other variables.
- Compare and contrast gross and net pay.
- Create a spreadsheet to calculate balances in checking account register and reconcile a check register with bank account statement, including any bank charges.
- Compute simple and compound interest on a savings account.
- Determine total value of savings account in future.
- Find compound interest using a table and the compound interest formula.
- Calculate the interest for daily compounding.

- j. Compute the future value of an ordinary annuity and an annuity due.
- k. Compute average monthly expenditures.
- a. Use records of past expenditures or research to prepare a monthly budget sheet.
- b. Compare the amount budgeted to actual expenditures.

**Assessments/ Measurement of Objectives:**

- Student projects (assessed with rubric)
- Objective tests
- Student scenario responses
- Classroom application exercises
- Independent application exercises

**Suggested Methods of Instruction / Learning Activities:**

- Students create spreadsheets with appropriate formulas to simplify calculations
- Creation of authentic budgets based upon given scenarios
- Problem solving scenarios
- Comparison of job total salary and benefits with costs of employment (transportation, hours, clothing, etc)
- Textbook resources found in chapters 1-5

## Unit 2: Managing Your Expenses

**Estimated Time: 3-4 weeks**

### **Standard Alignment:**

- 2.1.11A** - Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11A** – Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11F** – Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11B** – Construct valid arguments from stated facts.
- 2.4.11E** – Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11A** – Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11B** – Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11D** – Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.

### **Curricular Objectives:**

Students will be able to:

- a. Calculate the price of various objects and/or complete projects including sales tax, fees, rebates, sale prices, price per unit, etc.
- a. Compute the finance charges associated with credit using various methods including the unpaid-balance method and the average-daily-balance method-new purchases included.
- b. Determine the long-term actual price of an object including finance charges (ex. Credit card purchases).
- c. Compare and contrast credit card offers in relation to fees, interest rates, and other mathematical variables.
- a. Compute the maturity value and interest rate of a single-payment loan.
- b. Calculate the down payment and the amount financed on an installment loan.
- c. Calculate the monthly payment, total amount repaid, and finance charge on an installment loan.
- d. Calculate the payment to interest, payment to principal and new balance.
- e. Compute the final payment when paying off an installment loan.
- f. Determine the annual percentage rate of a loan using a table and a formula.

### **Assessments/ Measurement of Objectives:**

- Student projects (assessed with rubric)
- Objective tests
- Student scenario responses
- Student research results
- Classroom application exercises
- Independent application exercises

### **Suggested Methods of Instruction / Learning Activities:**

- Creation of spreadsheets and use of other online tools related to objectives
- Student real-world projects (ex. Cost of owning a pet, budget for re-designing a room, etc)
- Guest speaker from local bank
- Student presentations
- Textbook resources found in chapters 6-8

## Unit 3: Vehicle Transportation

**Estimated Time: 3-5 weeks**

### **Standard Alignment:**

- 2.1.11A** - Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11A** – Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11F** – Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11B** – Construct valid arguments from stated facts.
- 2.4.11E** – Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11A** – Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11B** – Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11D** – Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11B** – Use appropriate technology to organize and analyze data taken from the local community.

### **Curricular Objectives:**

Students will be able to:

- a. Compute the actual expenses involved in purchasing a new car including sticker price, dealer's cost, trade-ins, rebates, taxes, tags and fees.
- b. Compute the actual expenses involved in purchasing a used car including price, trade-ins, rebates, taxes, tags and fees.
- c. Compute the actual expenses involved in leasing a vehicle include price, trade-in, mileage limitations, rebates, taxes, tags and fees.
- d. Use tables and/or calculations to compute the annual premium for vehicle insurance.
- e. Compute the total cost per mile of operating and maintaining a particular vehicle (including mileage, maintenance, insurance, depreciation, etc).

### **Assessments/ Measurement of Objectives:**

- Student presentations (with rubrics)
- Student authentic projects (with rubrics)
- Objective tests
- Student responses to scenarios
- Classroom application exercises
- Independent application exercises

### **Suggested Methods of Instruction / Learning Activities:**

- Buying a car project and class presentations
- Budgeting to afford your dream car exercise
- Use/creation of spreadsheets and other online tools
- Textbook resources found in chapter 9

## Unit 4: Housing and Insurance

**Estimated Time: 3-4 weeks**

### **Standard Alignment:**

- 2.1.11A** - Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11A** – Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11F** – Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11E** – Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11A** – Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11B** – Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11D** – Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11B** – Use appropriate technology to organize and analyze data taken from the local community.

### **Curricular Objectives:**

- A. Students will:
  - a. Compute the mortgage loan amount, monthly payment, the total amount paid, and the total interest charged given a specific scenario.
  - b. Calculate total closing costs.
  - c. Compute the allocation of the monthly payment to principal and interest and the new principal.
  - d. Calculate the assessed value and real estate taxes for a home.
  - e. Determine the amount of coverage for homeowners insurance and calculate the annual homeowner's insurance premium.
  - f. Compute total housing cost (including insurance, taxes, interest, heating, maintenance, etc) and compare it with suggested financial guidelines.
  - g. Calculate the average monthly cost of renting a home, and compare the total costs of renting to the total costs of owning a home.
  - a. Compute health insurance premiums and calculate the amount the patient pays for health care.
  - b. Apply tables to data to compute the annual premiums for three types of life insurance.

### **Assessments/ Measurement of Objectives:**

- Student presentations (with rubrics)
- Student authentic projects (with rubrics)
- Objective tests
- Student responses to scenarios
- Classroom application exercises
- Independent application exercises

### **Suggested Methods of Instruction / Learning Activities:**

- Use online sources such as Realtor.com to compute and compare housing costs locally with those in another location. Calculate salary and earnings needed to maintain comparable standard of living in these locations.
- Creation of spreadsheets and use of other online tools related to objectives
- Student real-world projects (ex. Cost of owning a pet, budget for re-designing a room, etc)
- Guest speakers
- Student presentations
- Textbook resources found in chapters 10-11

## Unit 5: Investments

**Estimated Time: 3-5 weeks**

### Standard Alignment:

- 2.1.11A - Use operations (e.g., opposite, reciprocal, absolute value, raising to a power, finding roots, finding logarithms).
- 2.2.11A - Develop and use computation concepts, operations and procedures with real numbers in problem-solving situations.
- 2.2.11F - Demonstrate skills for using computer spreadsheets and scientific and graphing calculators.
- 2.4.11B - Construct valid arguments from stated facts.
- 2.4.11E - Demonstrate mathematical solutions to problems (e.g., in the physical sciences).
- 2.5.11A - Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.
- 2.5.11B - Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.
- 2.5.11D - Conclude a solution process with a summary of results and evaluate the degree to which the results obtained represent an acceptable response to the initial problem and why the reasoning is valid.
- 2.6.11B - Use appropriate technology to organize and analyze data taken from the local community.

### Curricular Objectives:

#### Chapter 12

- A. Students will:
  - a. Use tables or a formula to compute interest on certificates of deposit and other investments.
  - b. Determine the annual percentage yield.
  - c. Calculate the total cost of a stock investment.
  - d. Calculate the profit or loss from a stock sale, including tax implications.
  - e. Compute the annual dividend and annual yield of a stock investment.
  - f. Compute the loading charge, number of shares purchased, and profit or loss when you sell a mutual fund.
  - g. Compute the annual interest and annual yield of a bond investment.
  - h. Compute the annual net income, the annual yield, and monthly rent to charge on an investment in real estate rental property.
  - i. Compute the required minimum distribution (RMD) and the penalty for early withdrawal from an individual retirement account (IRA).
  - j. Through calculations, compare and contrast the long term financial impact of specific purchases versus saving/investing.

### Assessments/ Measurement of Objectives:

- Student presentations (with rubrics)
- Student authentic projects (with rubrics)
- Objective tests
- Student responses to scenarios
- Classroom application exercises
- Independent application exercises

### Suggested Methods of Instruction / Learning Activities:

- Creation of spreadsheets and use of other online tools related to objectives
- Student real-world projects (ex. Cost of owning a pet, budget for re-designing a room, etc)
- Guest speakers
- Student presentations
- Textbook resources found in chapter 12